

Appendix B: Example Calculation

Guidelines for Calculating General Land Area Minimum

DRAFT, May 5, 2017

Introduction

This document, *Appendix B: Example Calculation*, includes an example calculation to supplement the *Guidelines for Calculating General Land Area Minimum* and to provide illustrations of what the *Technical Instructions* provided in Appendix A should yield. This Example Calculation is based on a fictionalized municipality called Landborough.

Step 1: Identify SHI Sites

- 1.1. Create a list of SHI Sites.
- 1.2. Join the SHI Sites list to digital parcels.
- 1.3. Provide the SHI Sites list to DHCD for the Group Homes Acreage Calculation.

The SHI Sites table will look similar to **Figure 1**. The initial GIS workspace will look similar to the map in **Figure 2**.

Step 2: Calculate Total Land Area

- 2.1. Identify water bodies.
- 2.2. Provide locations of Previously-Registered Inland Wetlands, if applicable.
- 2.3. Identify areas where residential, commercial, or industrial use is prohibited.
- 1.1. Combine all non-parcel-based Excluded Areas.
- 1.2. Create the Total Land Area file to begin removing excluded areas step-by-step.
- 1.3. Remove non-parcel-based Excluded Areas from Total Land Area.
- 1.4. Remove public rights of way controlled by the United States, the Commonwealth of Massachusetts, or any Political Subdivision thereof.
- 1.5. Remove fee parcels and other land owned by the United States, the Commonwealth of Massachusetts, or any Political Subdivisions thereof.
- 1.6. Calculate Total Land Area.

Water bodies are shown in **Figure 3**. Water bodies along with areas where residential, commercial, and industrial development are prohibited are shown in **Figure 4**. The areas identified in steps 2.1, 2.2, and 2.3 are generally not based on parcel boundaries. These are combined into a single feature class in Step 2.4 using the Union function, and then are excluded from Total Land Area as part of the step-by-step process described in steps 2.5 and 2.6. **Figure 5** shows steps 2.6 and the first part of step 2.7; the removal of non-parcel-based excluded areas and the identification of publicly-owned rights-of-way. **Figure 6** shows the removal of public-rights-of-way and the identification of publicly-owned properties. It also shows Housing Authority properties that contain SHI-Eligible Housing units as part of the publicly-owned properties. SHI-Eligible Housing Authority properties cannot be excluded from Total Land Area so the definition query will need to be modified accordingly. **Figure 7** shows Total Land Area parcels once all exclusions have been made. The results of merging the Total Land Area file is shown in **Figure 8**. From this layer, the acreage for Total Land Area can be calculated. For Landborough, the entire land area within the municipal boundary is 6,837 acres. Total Land Area in Landborough, once all of the exclusions have been made, is 3,871 acres. This could change after the Group Homes Acreage Calculation has been provided.

Step 2: Calculate SHI Eligible Area

- 2.1. Remove any areas that are not Directly Associated Areas from SHI Site parcels.
- 2.2. Review SHI Sites for any overlap with wetlands.
- 2.3. Calculate the SHI-Eligible Area (not yet pro-rated).
- 2.4. Calculate the pro-rated SHI-Eligible Area.

Figure 9, Figure 10, Figure 11, Figure 12, Figure 13, Figure 14, Figure 15, Figure 16, Figure 17, Figure 18, and **Figure 19** show each of the SHI Sites in Landborough, edited for wetlands and vegetation.

Figure 20 shows the additional calculations needed to pro-rate the SHI-Eligible Area and finalize the acreage for each SHI Site excepting group homes acreage.

Step 3: Calculate Results

- 3.1. Calculate results and preliminary determination of 1.5% General Land Area Minimum.

45 acres/3,871 acres = 1.16%

Figure 1: SHI Sites Table (prior to any calculations)

MuniName	DHCD_ID	ProjName	Address	SHI_Units	Tenure	NumParcels	LOC_ID
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX001
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX002
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX003
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX004
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX005
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX006
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX007
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX008
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX009
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX010
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX011
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX012
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX013
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX014
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX015
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX016
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX017
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX018
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX019
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX020
Landborough	LB01	Housing Authority Rental Subdivision A	Mapletree Road	80	Rental	21	F_XXXXXX_XXXX021
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX022
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX023
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX024
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX025
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX026
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX027
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX028
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX029
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX030
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX031
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX032
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX033
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX034
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX035
Landborough	LB02	Housing Authority Rental Subdivision B	Blueberry Street	26	Rental	15	F_XXXXXX_XXXX036
Landborough	LB03	Housing Authority Rental Development A	Common Avenue	25	Rental	1	F_XXXXXX_XXXX037
Landborough	LB04	Housing Authority Rental Development B	Broad Street & Pleasant Avenue	24	Rental	1	F_XXXXXX_XXXX038
Landborough	LB05	Housing Authority Rental Development C	Oakview Drive	100	Rental	1	F_XXXXXX_XXXX039
Landborough	LB06	Housing Authority Rental Development D	98 Lincoln Drive	8	Rental	1	F_XXXXXX_XXXX040
Landborough	LB07	Housing Authority Rental Development E	Swan Circle	80	Rental	1	F_XXXXXX_XXXX041
Landborough	LB08	Heritage of Landborough Assisted and Independent Living	789 Bay Street	95	Rental	1	F_XXXXXX_XXXX042
Landborough	LB09	Roosevelt Crossing	1000 Roosevelt Avenue	300	Rental	1	F_XXXXXX_XXXX043
Landborough	LB10	Evermore Station Apartments	Aspen Street and Emerson Road	285	Rental	1	F_XXXXXX_XXXX044
Landborough	LB11	Lilac Lane Multifamily	Lilac Lane	3	Rental	1	F_XXXXXX_XXXX045
Landborough	LB12	BoroBrook Adult Living Condominiums	453 West Street	15	Ownership	1	F_XXXXXX_XXXX046

Figure 2: In Step 1, the Analyst will locate the SHI Sites and match them to parcels in GIS.

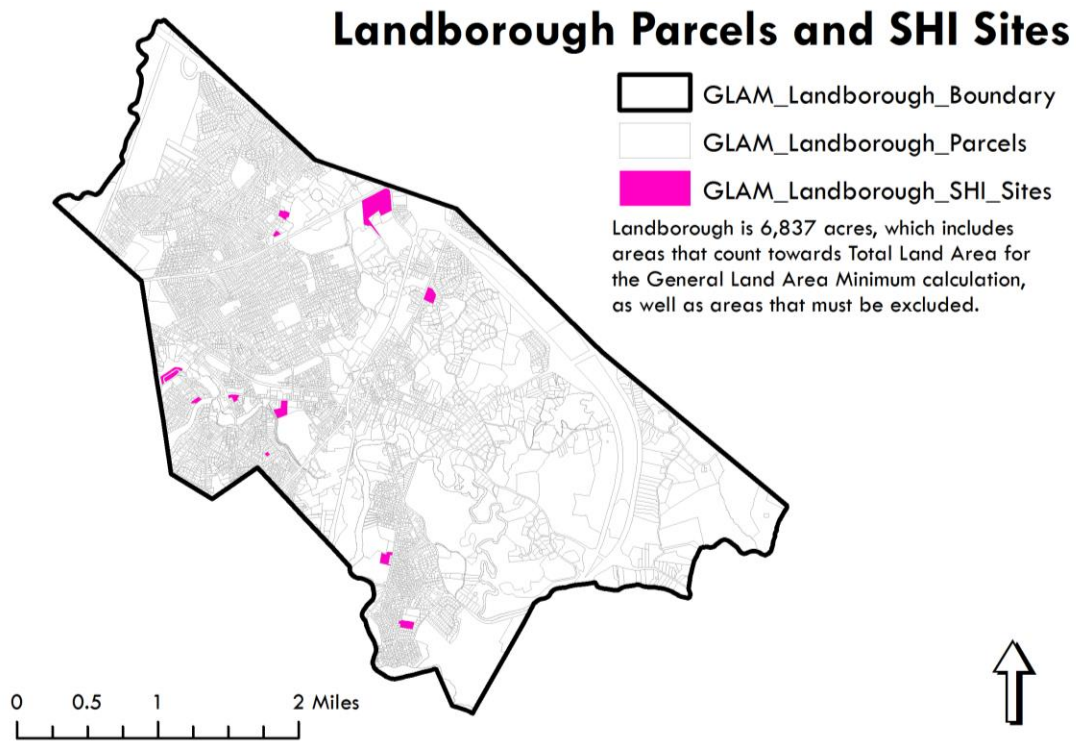


Figure 3: Water Bodies in Landborough

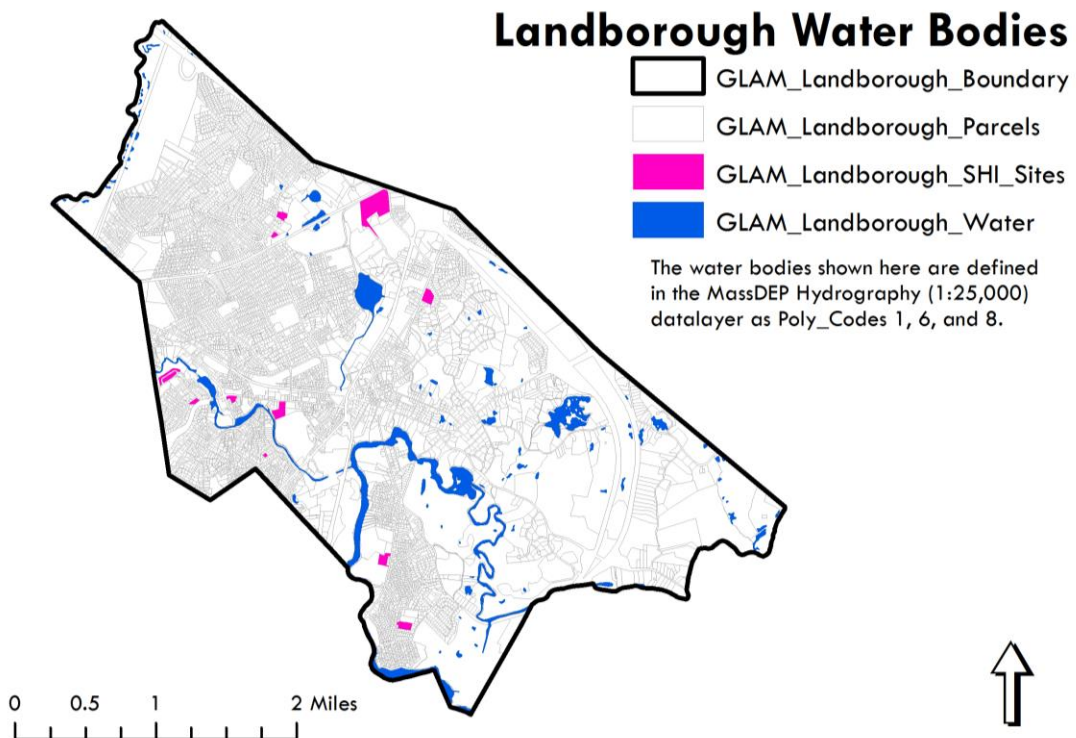


Figure 4: An example of how additional non-parcel-based areas where development is prohibited, such as Registered Wetlands or certain zoning districts, can be added as additional datalayers. Following this step, these datalayers are combined into a single feature class using the Union function.

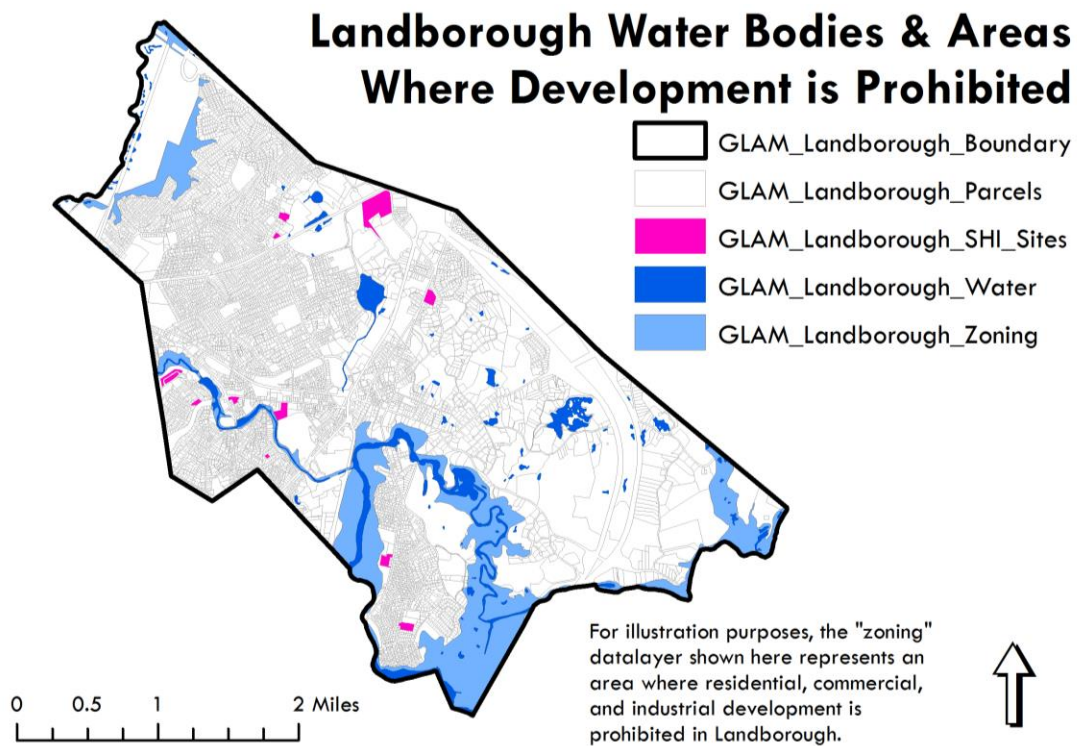


Figure 5: Beginning of the Total Land Area calculation. Water bodies, registered inland wetlands, and areas where development is prohibited have been excluded and public rights of way have been identified.

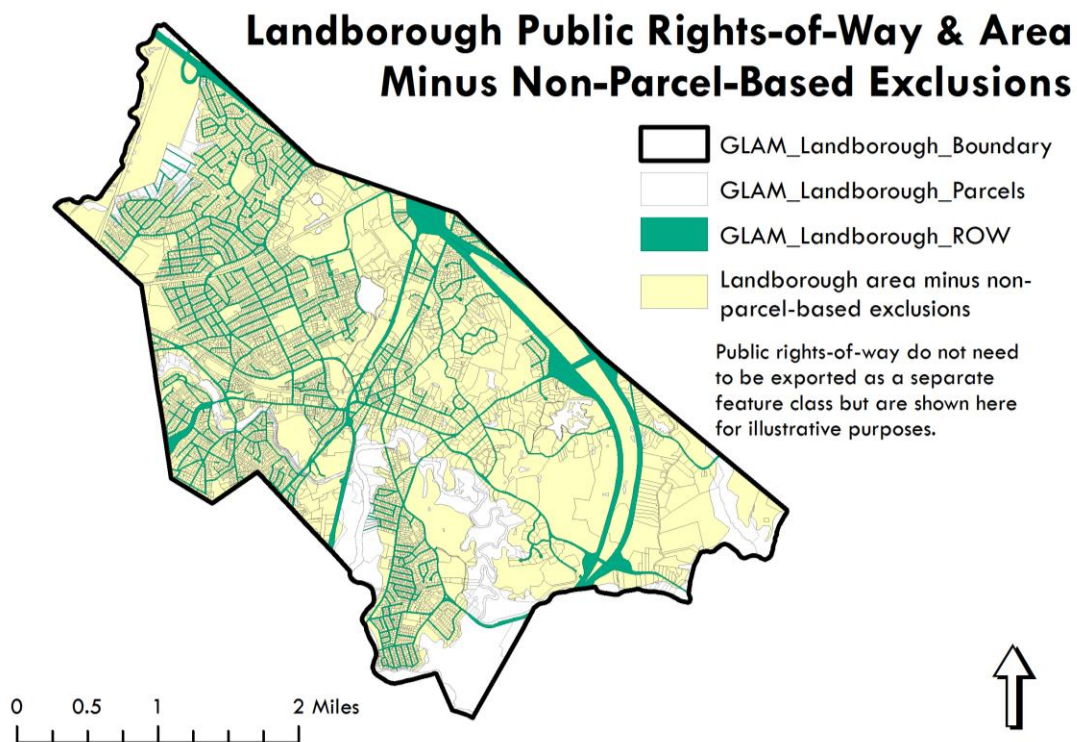


Figure 6: Publicly-Owned Land including SHI-Eligible Housing Authority Properties

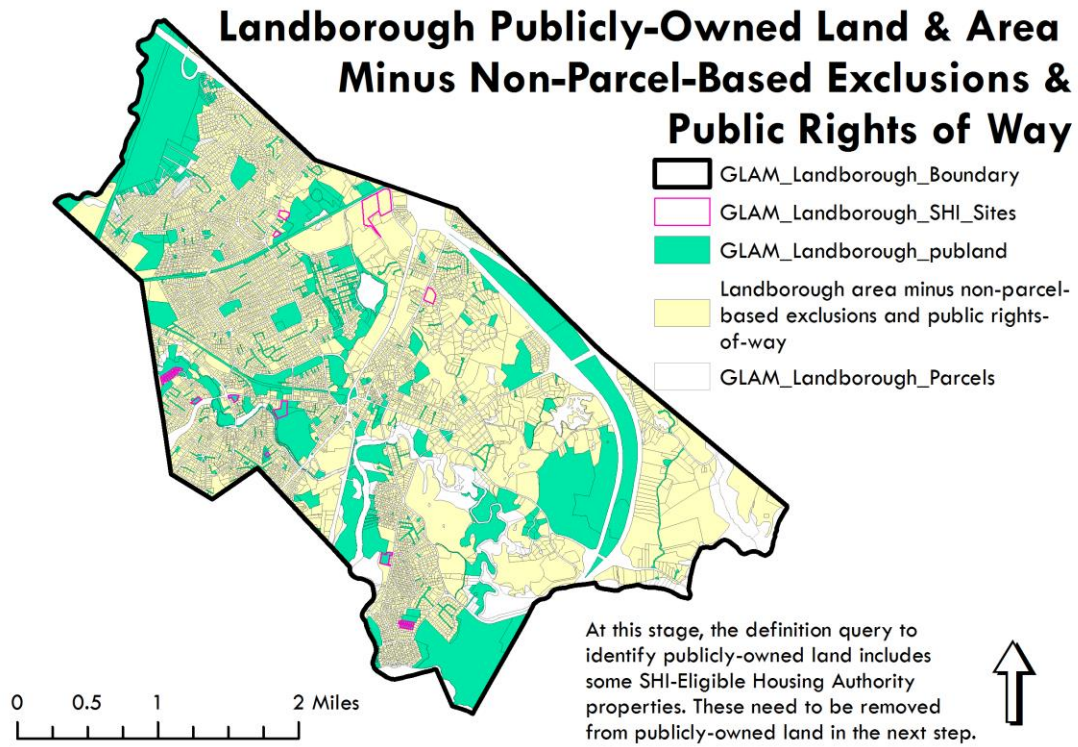


Figure 7: Total Land Area Parcels

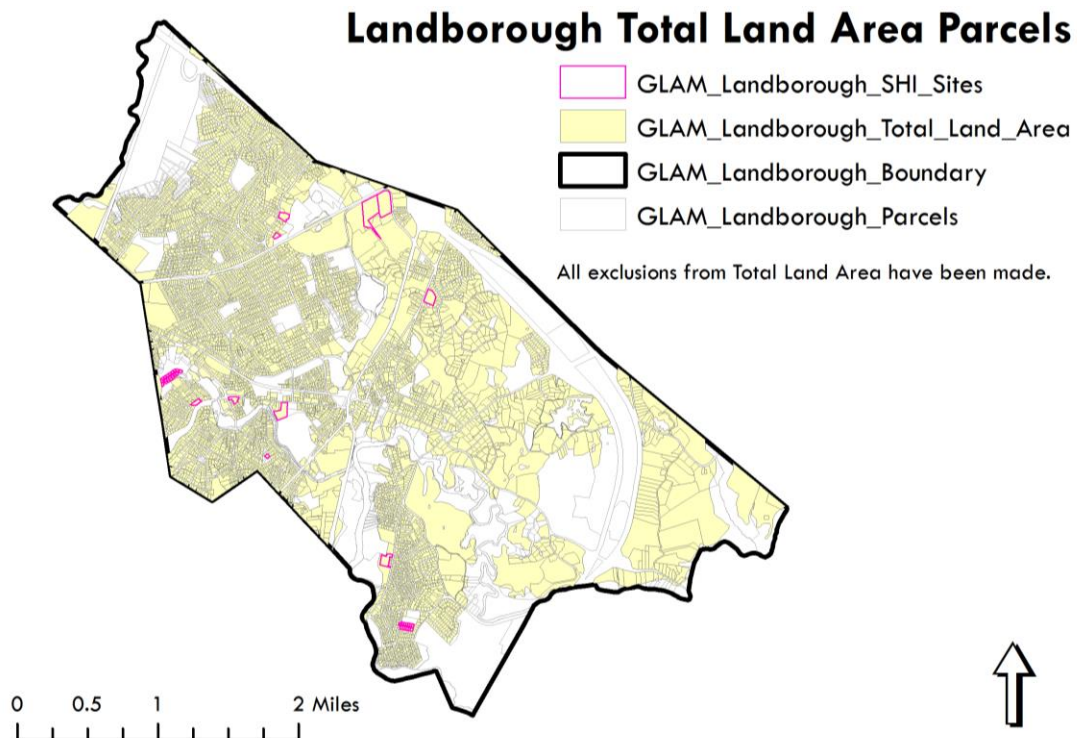


Figure 8: Total Land Area can be calculated by merging the Total Land Area parcels together in the Editor tool. This number may change once the Group Homes Acreage Calculation has been provided.

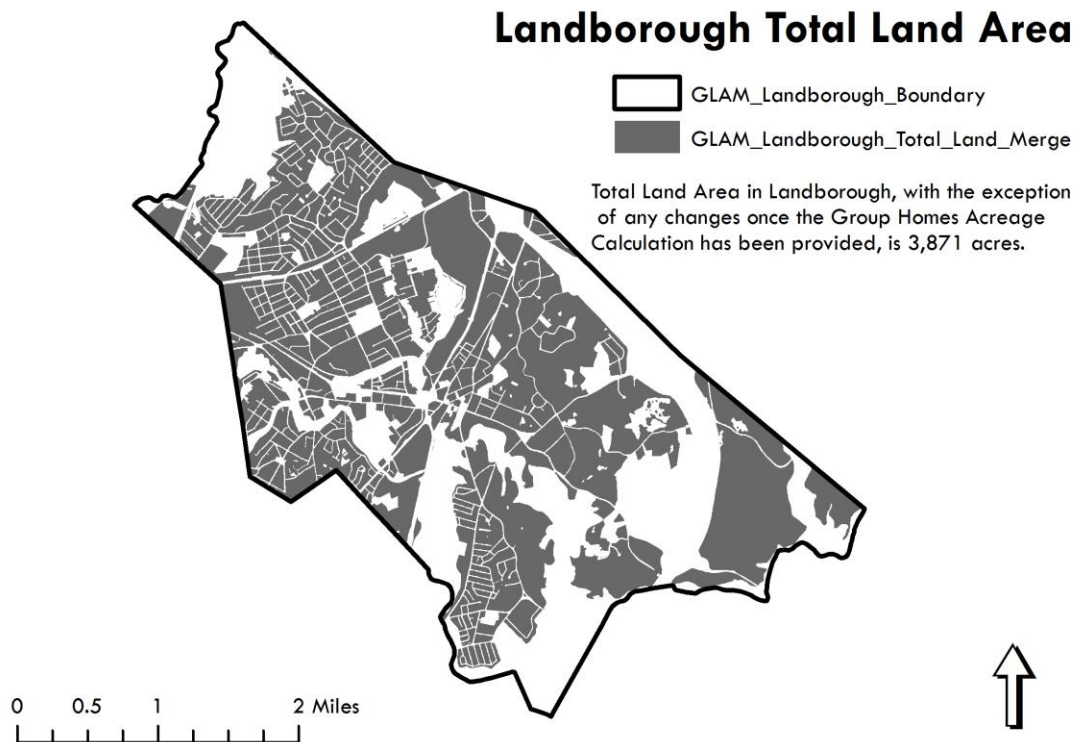


Figure 9: The first SHI development in the SHI Sites list is Housing Authority Rental Subdivision A. None of the parcels in this subdivision overlap with wetlands, and all land within the parcels appears to be Directly Associated with the SHI Eligible Housing units.

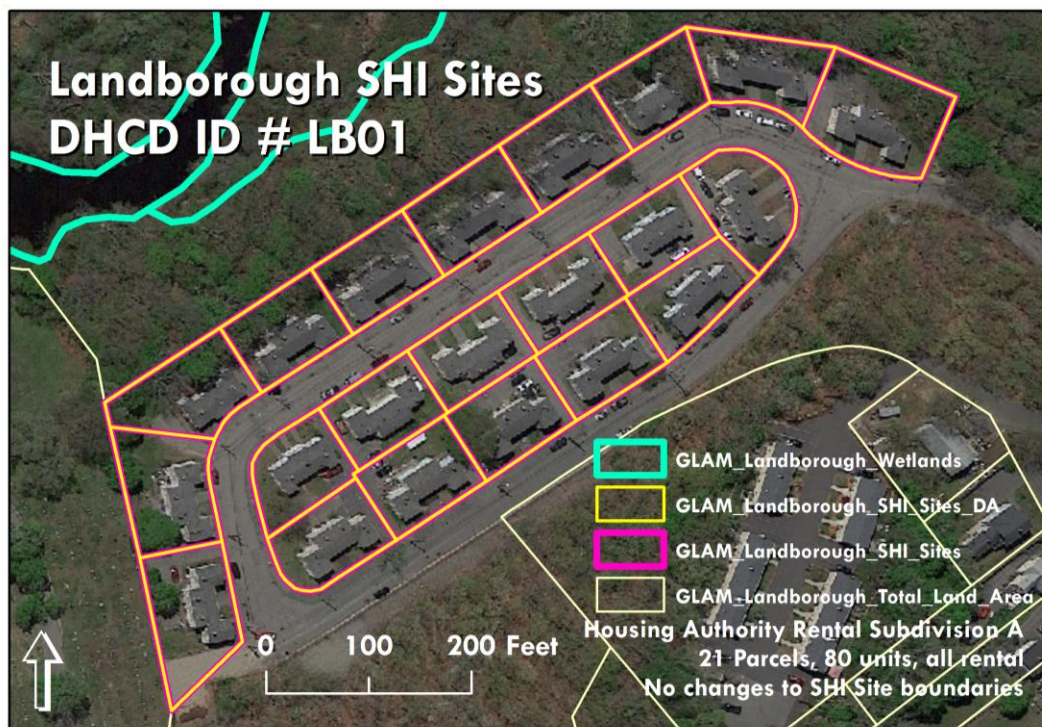


Figure 10: Housing Authority Rental Subdivision B. An interior roadway parcel and a small parcel not containing any housing are part of the SHI development and can be considered Directly Associated with the SHI-Eligible Housing units. The land within each parcel also appears to be Directly Associated.

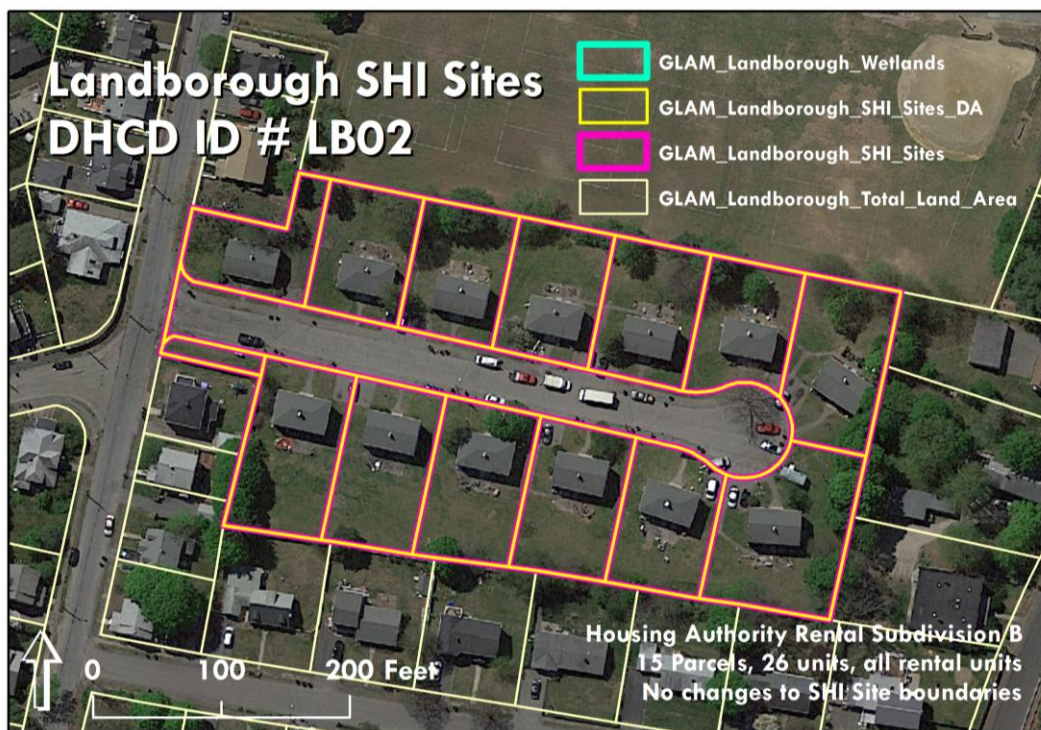


Figure 11: A single-parcel rental Housing Authority rental development with 25 SHI-Eligible Housing units. No changes were made to the SHI Site boundaries.



Figure 12: Similar to the previous example. Housing Authority Rental Development B.



Figure 13: Note that this parcel is near a wetland, but does not overlap with it, so no changes have been made to the SHI Site boundaries.

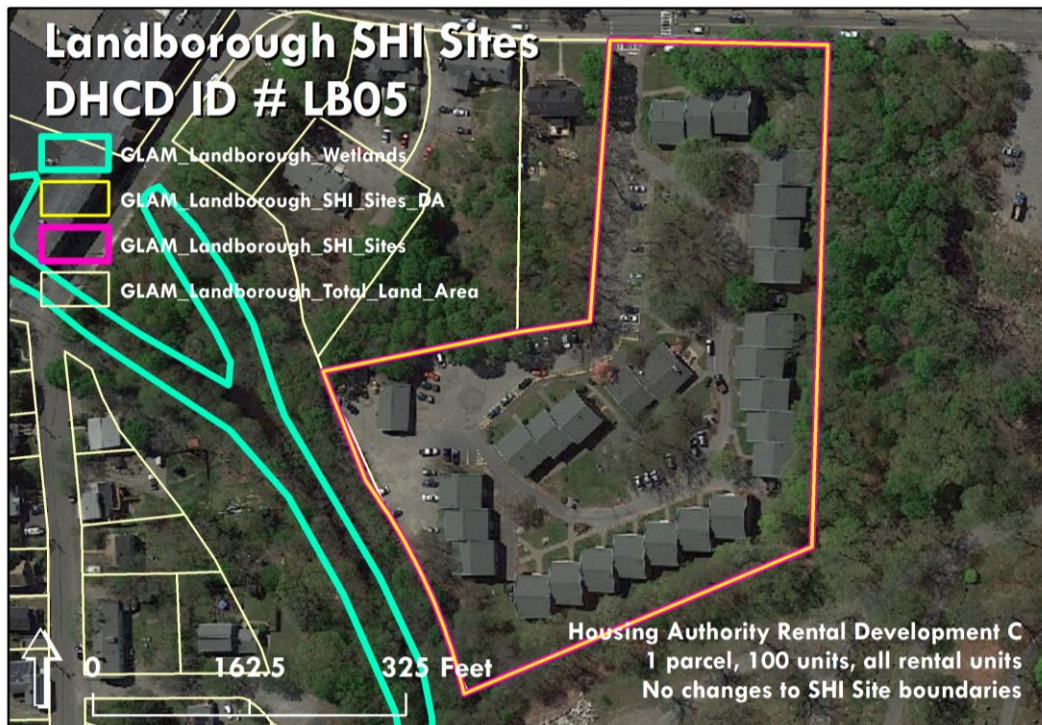


Figure 14: This parcel is heavily vegetated, so the SHI Site boundary was modified to exclude much of the vegetation.



Figure 15: This parcel overlapped with wetlands, so the SHI Site boundary was modified accordingly.

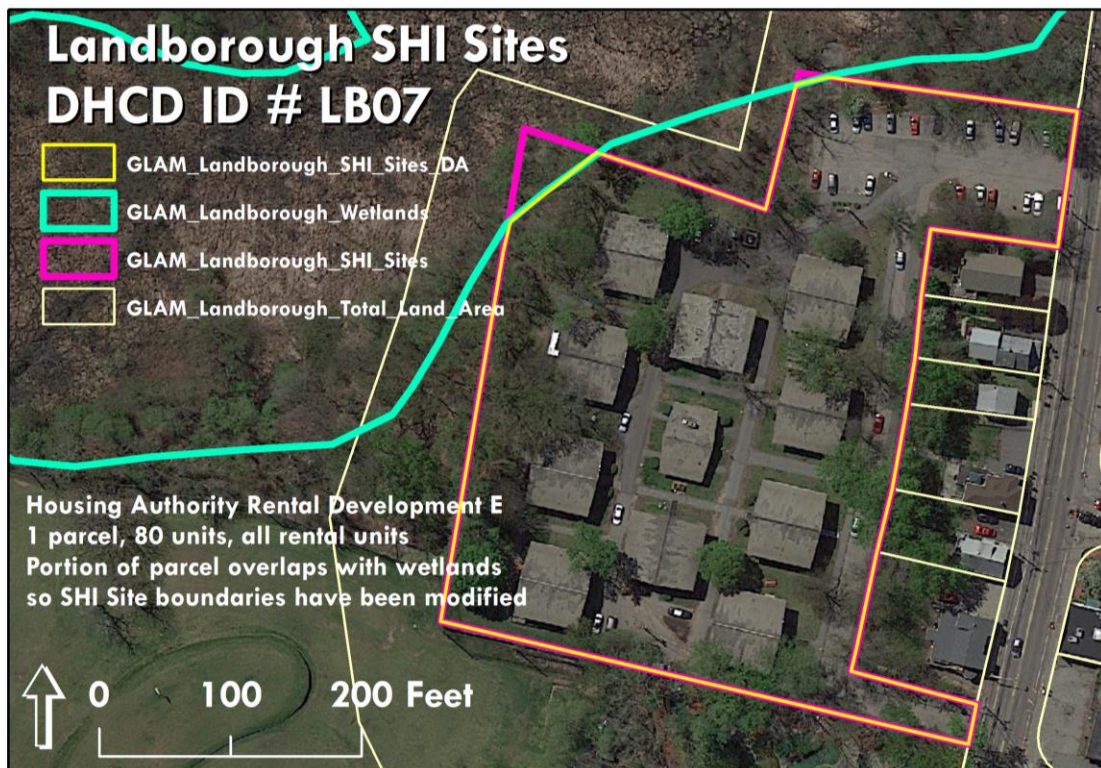


Figure 16: Assisted and independent living facility with no changes to SHI Site boundary.

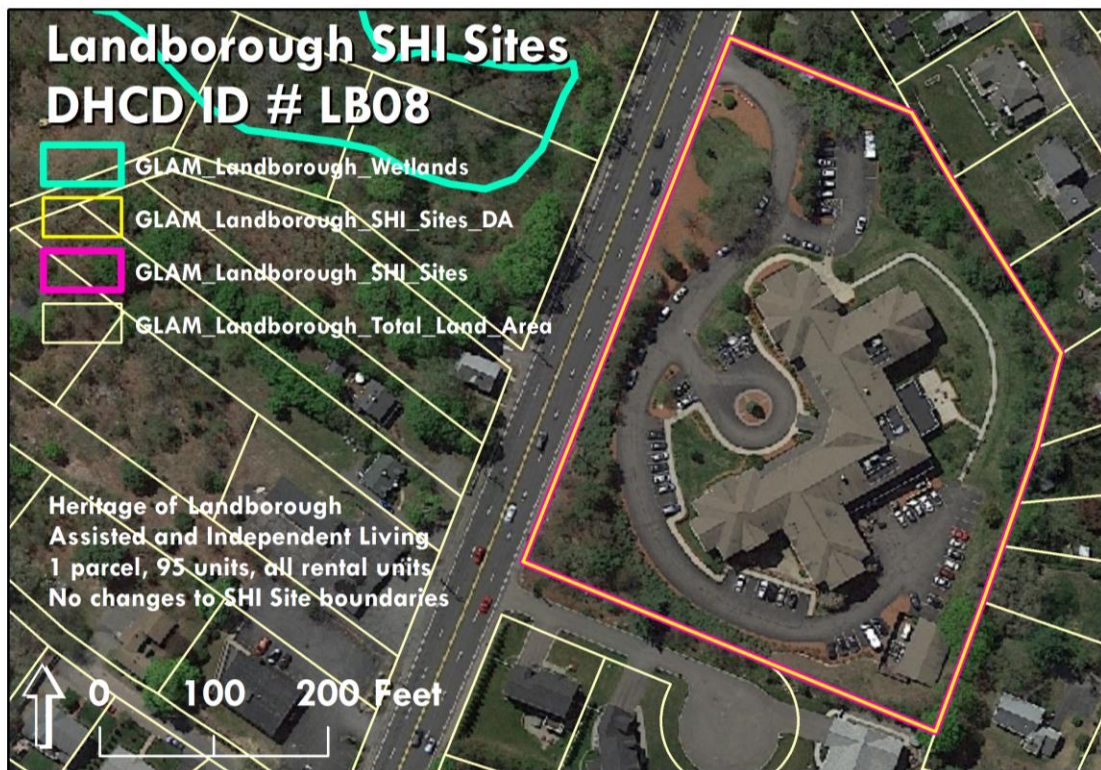


Figure 17: Two adjacent SHI developments can be shown on a single map, as long as the image is clear. The parcel on the left overlapped slightly with a wetland so the SHI Site boundary was modified accordingly, highlighted with the green circle in the image below.

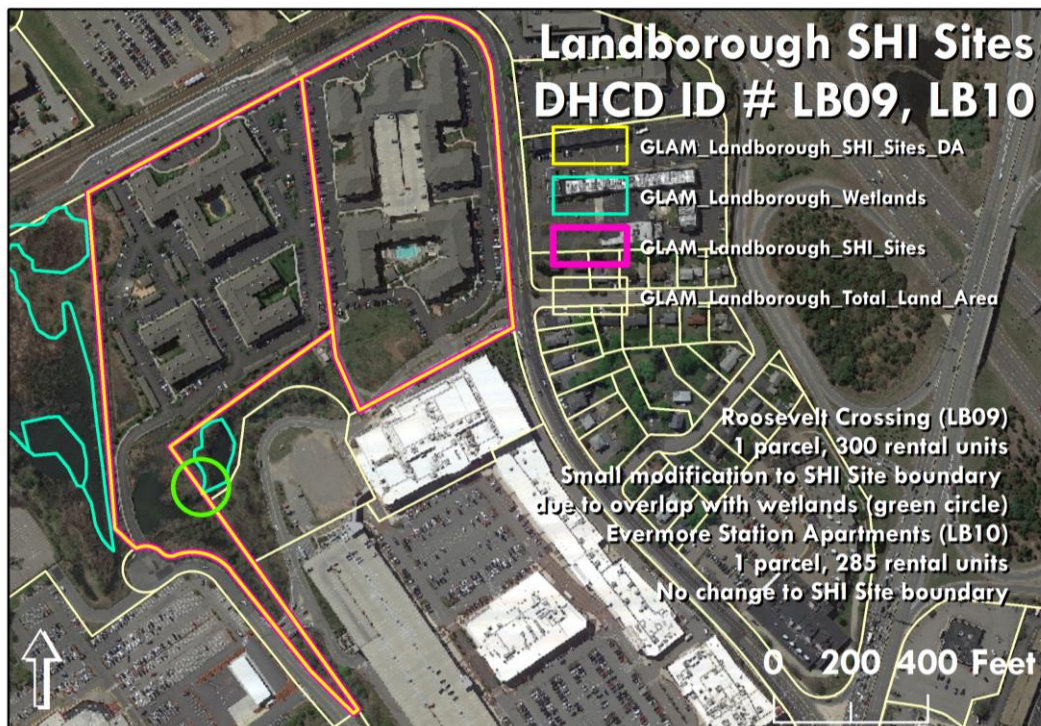


Figure 18: This SHI Site parcel overlaps with wetlands and includes heavy vegetation, so the SHI Site was modified accordingly.

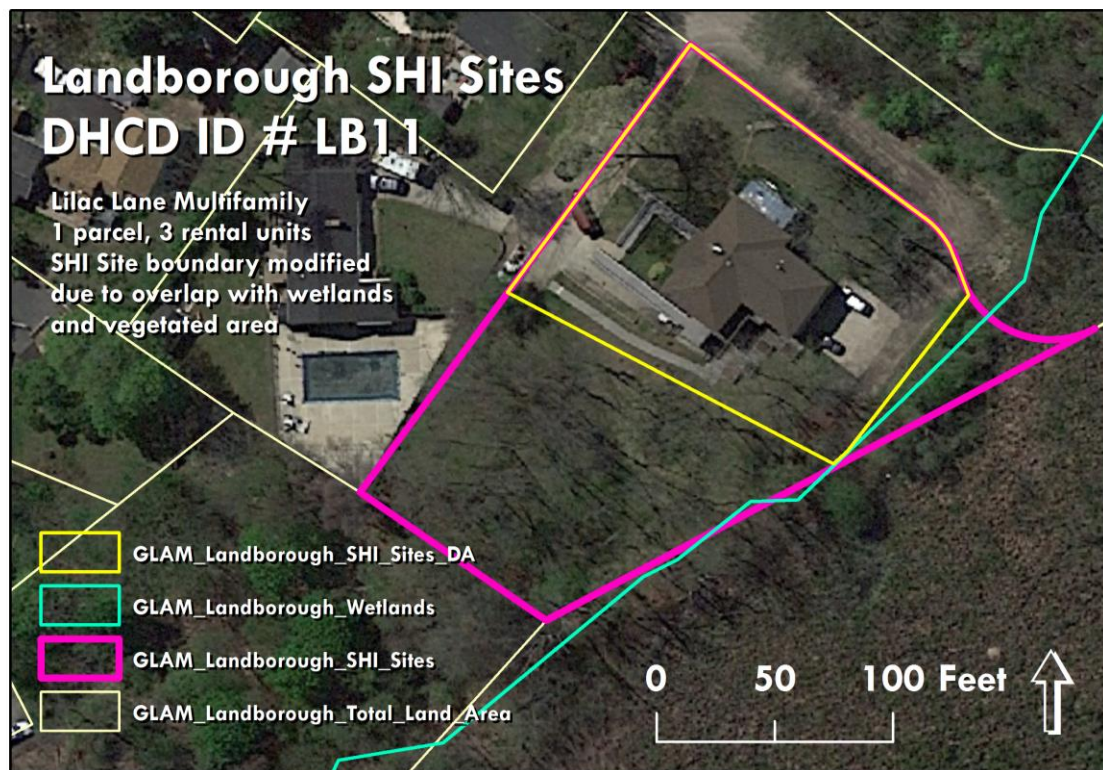


Figure 19: This SHI development is a condominium building, and was represented by several identical overlapping parcel polygons which needed to be merged to a single polygon using the Editor tool. Then, the SHI site was modified to remove the part that overlapped with wetlands. As a homeownership development, the SHI Units must be prorated. There are 60 total units in the development, of which 15 are SHI Eligible Housing units.

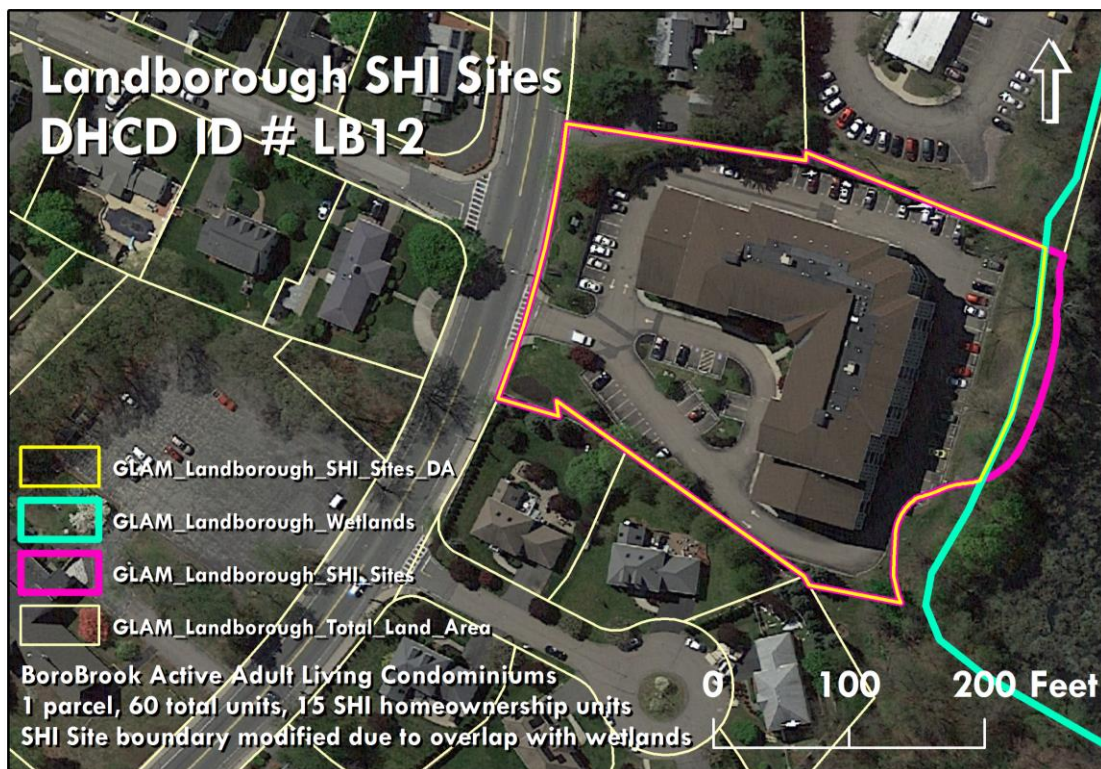


Figure 20: Final calculations to determine SHI-Eligible Housing land area (except for Group Homes acreage)

DHC D_ID	ProjName	SHI_Units	TotUnits	LotUnits	Tenure	NumP arcls	LOC_ID	ac_p _unit	eligible_ area	pct_eli gible	prorate d_area	reqlot area	SHI_ area
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx001		0.19127 33949	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx002		0.17172 70255	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx003		0.27064 27466	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx004		0.19038 70934	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx005		0.19395 29855	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx006		0.19921 88560	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx007		0.17102 75100	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx008		0.18231 51708	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx009		0.17333 20392	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx010		0.17436 81766	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx011		0.18194 21221	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx012		0.17314 00510	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx013		0.18149 76913	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx014		0.21040 02407	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952 381	Rental	21	F_xxxxxx_ xxx015		0.16904 38669	100%			

LB01	Housing Authority Rental Subdivision A	80	80	3.80952381	Rental	21	F_XXXXXX_XXXX016	0.1820477762	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952381	Rental	21	F_XXXXXX_XXXX017	0.1694669966	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952381	Rental	21	F_XXXXXX_XXXX018	0.1842353292	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952381	Rental	21	F_XXXXXX_XXXX019	0.2263480429	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952381	Rental	21	F_XXXXXX_XXXX020	0.1736166806	100%			
LB01	Housing Authority Rental Subdivision A	80	80	3.80952381	Rental	21	F_XXXXXX_XXXX021	0.2342462166	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX022	0.1551173776	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX023	0.1748646623	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX024	0.1803227181	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX025	0.1847486618	100%			
LB02	Housing Authority Rental Subdivision B	26	26	0	Rental	15	F_XXXXXX_XXXX026	0.0281586135	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX027	0.1876980409	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX028	0.1702596281	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX029	0.2188315496	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX030	0.2291336570	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX031	0.2116242243	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX032	0.2146911830	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX033	0.2048392054	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX034	0.1882748136	100%			
LB02	Housing Authority Rental Subdivision B	26	26	2	Rental	15	F_XXXXXX_XXXX035	0.2834883198	100%			
LB02	Housing Authority Rental Subdivision B	26	26	0	Rental	15	F_XXXXXX_XXXX036	0.5260469459	100%			
LB03	Housing Authority Rental Development A	25	25	25	Rental	1	F_XXXXXX_XXXX037	1.0561352651	100%			
LB04	Housing Authority Rental Development B	24	24	24	Rental	1	F_XXXXXX_XXXX038	1.4787018076	100%			
LB05	Housing Authority Rental Development C	100	100	100	Rental	1	F_XXXXXX_XXXX039	4.6917358555	100%			
LB06	Housing Authority Rental Development D	8	8	8	Rental	1	F_XXXXXX_XXXX040	0.1251925454	100%			
LB07	Housing Authority Rental Development E	80	80	80	Rental	1	F_XXXXXX_XXXX041	3.2636477088	100%			
LB08	Heritage of Landborough Assisted and Independent Living	95	95	95	Rental	1	F_XXXXXX_XXXX042	3.9715737412	100%			
LB09	Roosevelt Crossing	300	300	300	Rental	1	F_XXXXXX_XXXX043	11.6549337915	100%			
LB10	Evermore Station Apartments	285	285	285	Rental	1	F_XXXXXX_XXXX044	9.4944550066	100%			
LB11	Lilac Lane Multifamily	3	3	3	Rental	1	F_XXXXXX_XXXX045	0.4196377981	100%			
LB12	BoroBrook Adult Living Condominiums	15	60	60	Owners hip	1	F_XXXXXX_XXXX046	2.0597457187	25%			